

## PORTABLE COMPUTER WITH HINGED COVER HAVING A WINDOW

### FIELD OF THE INVENTION

The present invention relates to portable computers, and more particularly relates to methods and apparatuses facilitating user interaction with a portable computer without first opening a computer display cover.

### BACKGROUND OF THE INVENTION

Portable computers are available in a wide variety of styles, including laptops, notebooks, palmtops, and write-on computers (the latter also being variously known as slate computers or pen computers, and being characterized by the absence of an alphanumeric keyboard). Some portable computers have an LCD or other flat-panel display that is protected from abuse by a hinged display cover.

Exemplary of these prior art display covers is the arrangement shown in Design Patent 321,865, wherein a hinged plastic plate overlies and protects the display of a write-on computer. Another common arrangement is that shown in allowed design patent application 07/652,743, wherein the display of a palmtop computer is protected by another component of the computer (such as the keyboard) folded adjacent thereto.

All of these arrangements suffer from a common failing: there is virtually no provision for user interaction with the computer when the cover is closed. (Some computers can "beep" at the user when the cover is closed.) As disclosed below, this is an unnecessary impairment of the computer's capabilities.

In accordance with one aspect of the present invention, a computer is provided with a display cover that permits visual—and in some cases tactile or stylus-based—interaction with the computer, even when the cover is closed. Such a computer may also be equipped with a touch-responsive input device that permits a user to acknowledge alerts from the computer, again without opening the display cover. In many embodiments, the computer is provided with an improved display cover hinge that facilitates operation.

The foregoing and additional features and advantages of the invention will be more readily apparent from the following detailed description thereof, which proceeds with reference to the accompanying drawings.

### BRIEF DESCRIPTION OF THE DRAWINGS

FIG. 1 is a view of a write-on computer according to a first embodiment of the present invention.

FIG. 1A is a simplified schematic block diagram of the computer of FIG. 1.

FIG. 2 is a detail showing a double-pivot hinge used to connect the cover to the housing in the write-on computer of FIG. 1.

FIG. 3 is a sectional view of the write-on computer of FIG. 1, illustrating (in solid lines) the cover in a first position overlying the input/output screen and (in dashed lines) the cover position flush against the back of the housing.

FIG. 4 is a side view, partially in section, showing the write-on computer of FIG. 1 arranged in an easel configuration.

FIG. 5 is a detail of a write-on computer incorporating a double-pivot hinge according to a second embodiment of the present invention.

FIG. 6 shows a write-on computer incorporating a double-pivot hinge according to a third embodiment of the invention.

FIG. 7 is an exploded view of a write-on computer incorporating a double-pivot hinge according to a fourth embodiment of the invention.

FIG. 8 is an exploded view of a write-on computer incorporating a double-pivot hinge according to a fifth embodiment of the invention.

FIG. 8A is a detail showing a detent arrangement suitable for use with the FIG. 8 embodiment.

FIG. 8B is a further detail showing a detent arrangement suitable for use with the FIG. 8 embodiment.

FIG. 9 is a view of a write-on computer according to a sixth embodiment of the present invention.

FIG. 10 is a detail illustrating a flip-around double-pivot hinge used to couple the cover of the FIG. 9 computer to the housing.

FIG. 11 further details operation of the flip-around double-pivot hinge used with the computer of FIG. 9.

FIG. 12 is a top plan view, partially in section, illustrating the double-pivot hinge of FIG. 11.

FIG. 13 is a sectional view illustrating the double-pivot hinge of FIG. 11.

### DETAILED DESCRIPTION

Referring to FIGS. 1 and 1A, a write-on computer 10 according to a first embodiment of the present invention includes a housing 12, a microprocessor 13, an input/output screen 14 mounted in the housing and coupled to the microprocessor, and a cover 16 movable between first and second positions. In the first position, the cover overlies and protects the input/output screen from damage. In the second position, the cover exposes the input/output screen for use.

In the preferred embodiment, the cover defines a window 18 which permits a portion of the input/output screen 14 to be viewed by the user even when the cover 16 overlies the screen. This window can include a transparent, rigid medium 20 serving to protect the screen from damage while permitting viewing therethrough. Alternatively, such a transparent medium can be omitted.

Window 18 finds particular application in conjunction with software applications that stay resident even when the computer is not in active use. Exemplary are software appointment calendars into which a user loads data relating to upcoming appointments. Many such programs include alarm features to alert the user to imminent appointments, even when the computer is otherwise idle. Another example of resident software applications are e-mail communications programs that alert users to incoming messages.

Previously, such programs have activated an audible tone alert device. In response, the user would open the computer to view the screen and determine the reason for the audible alert.

In accordance with this embodiment of the present invention, the software not only activates an audible alert device 21, but also displays an explanatory message on a portion 22 of the screen 14 visible through the window. By glancing at the computer, the user can determine the reason for the alert without going to the effort of opening the computer.

In addition to alert messages, the window can also be used to convey information relating to equipment status. In one such application, information pertaining to battery charge is